Part II
Poster Abstracts

A New Curriculum Supplement on Environmental Health for Middle School Students
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The NIH Office of Science Education in collaboration with the National Institute of Environmental Health Sciences developed a new curriculum supplement to be used in middle school
(Grades 6-9). It is entitled "Chemicals, the Environment, and You: Explorations in Science and Human Health". The supplement was designed and written by Biological Sciences Curriculum Study (BSCS) in Colorado Springs, Colorado and includes a companion CD-ROM which was produced by Videodiscovery in Seattle, Washington. The supplement consists of a sequence of five inquiry-based activities (including one wet lab) which are keyed to the middle school National Science Education Standards. Students will learn about the nature of chemicals and toxins in the environment, understanding dose-response and individual susceptibility, and assessing the risks from environmental toxicants. The supplements will be made available free to middle school teachers and are expected to be available late fall or early winter this year.
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Partnerships of The Center, WEACT and Harlem Health Promotion Center
COEP of NIEHS Center for Environmental Health in Northern Manhattan
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The Community Outreach and Education Program (COEP) of the NIEHS Center for Environmental Health in Northern Manhattan (the Center) is a formal collaboration between the Center and West Harlem Environmental Action (WE ACT), a community-based environmental justice organization. While the work of our COEP is focused on the local community of Northern Manhattan, our recent projects have broadened to make connections with and serve similar communities nationally. This poster highlights three of our projects from this past year. The focus of our collaborative efforts has been a national conference on "Human Genetics, Environment, and Communities of Color: Ethical and Social Implications," co-sponsored by WE ACT and the NIEHS Center, scheduled to take place at Columbia University on September 20th and 21st. 300 participants were pre-registered for the conference, including over 100 environmental health and justice activists. The conference had to be postponed to March 2002 due to the World Trade Center tragedy. The COEP continues to work to ensure the rescheduled conference will be successful in educating community advocates on genetics and environmental health, and in creating a forum to discuss the ethical, legal, and social implications of genetics research for communities of color. We also worked this past year to implement the "Traffic and Public Health" curriculum, funded by an administrative supplement jointly awarded last year to our COEP and the UCLA / USC COEP. This project allowed us to begin pilot-testing an air pollution curriculum with local high school youth, focusing on teaching the use of fine particle counters to monitor pollution associated with diesel exhaust. A third collaborative project we worked on was serving as guest editors for an Environmental Health Perspectives (EHP) supplemental issue entitled "Using Community-Based Participatory Research to advance Environmental Justice." We submitted the proposed package to EHP in August and anticipate a final publication date of April 2002. This supplement will be complemented by a community (lay) publication for October 2002, to be released at the Second National People of Color Environmental Summit.

Outreach to the Nursing Community
COEP: Harvard University Kresge Center for Environmental Health
Ann Backus, MS

Our unique Visiting Scholars Program (VSP) in the Department of Environmental Health and the Kresge Center for Environmental Health at the Harvard School of Public Health (HSPH) has been ongoing since 1988. The VSP now includes 25 professionals from academia, industry, non-profit organizations, and government agencies in the six New England states. In the nursing field we currently have as visiting scholars, two nurses from academia, one from a non-profit organization, and one from a state department of health (Vermont). Our outreach to the nursing community is through these visiting scholar nurses who keep current in the environmental health field by attending miniconferences that we offer as a key component of the Visiting Scholars Program at HSPH.

<u>The accomplishments of the visiting scholar nurses based in academia include</u>

- Satellite conferences and live conferences on preventing needle stick injuries and on relationships between the environment and health, approved for nursing contact hours by the ANA
- Training videos on needle stick injuries, hospital waste management, latex allergies, and pollution prevention in the healthcare industry
- Occupational Health Case Studies (now needing revision)
- Articles published in March and April 2001 in *Journal of the American Association of Occupational Health Nurses* supporting the need for curricula in occupational and environmental health
- Risky Business: Management of Health and IAQ, a presentation at American Nurses Association Annual Convention
- IOM core competencies for environmental health in nursing integrated into all clinical nursing curricula at Worcester State College and featured in *Nurses in Environmental Health: Success through Action,* a publication of the National Environmental Education and Training Association and ATDSR
- Integration of occupational and environmental health nursing curricula into undergraduate curricula at UMASS Lowell
- Presentations by invitation to National League for Nursing Educational Summit and American Association of Colleges of Nursing Annual Baccalaureate Education Conference

<u>The accomplishments of the visiting scholars nurse based in a non-profit organization include</u>

- Workshops under the auspices of Health Care Without Harm
- Developing and writing copy for The Environment and Health, Pollution Prevention Tool Kit, produced by the American Nurses Association
- Consultation on health care waste and pollution prevention in Sao Paulo, Brazil; Bombay, India; New Mexico, and on pediatric environmental health assessment and nursing issues for the Children's Environmental Health Network
- Education for nurses on the management of hospital/health care waste
- Web site development (www.nihe.org) featuring nursing and environment issues, linking Florence nightingale's early works to environmental issues
- Development of 'talking notes on healthcare waste management and pollution prevention,' an internal document for the World Bank task masters

<u>The accomplishments of a visiting scholar nurse based in state government include</u>

- Outreach through a state department of health nurse to resettled refugees in their home and work environments which includes development of a template pertaining to health status management for use by nurses and resettlement programs nationally

Development of the COEP Resource Center: Centralized Support for COEPs

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The NIEHS Community Outreach and Education Program (COEP) Resource Center is a physical and virtual resource designed to facilitate the exchange of materials and information among COEPs and to increase public awareness about NIEHS-supported outreach efforts. Development of the Resource Center began in October 2000 and is scheduled to be complete by April 2002, although expansion of the resources available will continue indefinitely. After consulting with an Advisory Board of representatives from nine different COEPs, Resource Center staff solicited and received a wide variety of outreach and education materials from individual COEPs. Information about these materials (over 400 in number) was compiled in a catalog, for use by COEP Directors and staff. The Resource Center also developed a Web site, which provides public access to the catalog and information about NIEHS-supported outreach activities and individual COEPs, as well as restricted access to archives of the COEP electronic mailing list. By April 2002 the Web site will provide public access to downloadable, electronic versions of catalog materials and will allow COEPs to submit new materials on-line. Thus, the Resource Center will allow COEPs to access and share with a wide audience a large and growing body of information and materials for direct use in outreach and education applications and for providing ideas and guidance for new outreach and educational efforts.

MIT COEP

Co-Directors: Profs. Patricia Culligan and Prof. Heidi Nepf

The focus of the MIT COEP is the promotion of scientific literacy for the non-scientific public in the areas of human and environmental health. In recent years our efforts have been in the creation of video curriculum, web-based activities and hands-on experiences for a 6th - 12th grade audience. Our poster will present an overview of the following three programs.

Human Health, Pollution and the Environment - Video/Curriculum Series:
This video series introduces the process of scientific investigation in the context of the center's research in environmental and human health. Topics include, e.g., the effects of pollution on human health; transport of pollutants in groundwater, surface water, and air; and the benefits and risks of civilian nuclear science and its past and future impacts on our society.

Investigating Groundwater Pollution - Video/Curriculum Package:
This package includes a thirty-minute video that introduces groundwater pollution, remediation and the Superfund Program. The video is supported with introductory material and a curriculum that includes both hands-on and web-based activities.

Hands-On Lab Activity at MIT:
Working with consulting teachers from the Cambridge Public Schools we are developing a hands-on

experimental experience in which 7th and 8th grade students build physical models that demonstrate potential human exposure pathways for environmental pollutants that travel in groundwater. The activity highlights the scientific processes of prediction and risk assessment in the context of several real scenarios of groundwater contamination.

WOMEN'S AND CHILDREN'S ENVIRONMENTAL HEALTH-NEW YORK STATE REGIONAL TOWN MEETINGS

New York University School of Medicine
Department of Environmental Health Sciences

This poster summarizes a Community Forum held on Saturday June 16, 2001 in the South Bronx. This was conducted as part of a series of forums funded by a Center supplement entitled: **Women and Children's Environmental Health-New York State Regional Town Meetings**. This supplement is a collaborative effort with University of Rochester Environmental Health Sciences Center. The main goal of this particular forum was to inform concerned citizens in the South Bronx about environmental health topics of concern to women and children in the urban environment. Another objective was to inform the community about the NIEHS Environmental Sciences Center at NYU and four community-based organizations that are available as environmental health resources for their particular concerns.

Prior meetings with community interest groups helped to determine the topics of the forum: asthma, air pollution, metals in the urban environment, gas and diesel generators, and community involvement. The forum also introduced an air pollution exposure study currently being conducted in the South Bronx by Center investigators. As part of this introduction, NYU's 30-foot EPA van was exhibited outside of the college in an effort to dispel any misconceptions about the van's presence in the community. Instrumentation specialists were present in the van to educate the community about the van's role in the project.

All informational materials were composed in both Spanish and English since the population in the South Bronx is predominantly Spanish speaking. Two moderators were chosen to introduce the speakers: Mr. Robert Williams from one of the community groups, Sports Foundation Inc., introduced the community speakers and Dr. George Thurston from NYU, introduced the NYU speakers. Our panel of speakers was comprised of both scientists from New York University and members of the community. Time was allotted at the end of the forum for a question and answer session. Finally, the audience was asked to fill out a questionnaire that we used as our evaluation tool.

Post-forum evaluation questionnaires indicated that the forum was successful in effectively educating the audience in the issues discussed. In addition, the forum generated a variety of favorable media attentions to our Center, including New York City TV, radio and newspaper coverage. The next "community forum" is being planned for the inner city of Newburgh in Orange County, New York.

Hydroville Curriculum Project and ToxRAP™ Train the Trainer Workshops
Environmental Health Sciences Center & Marine/Freshwater Biomedical Sciences Center at Oregon State University
Kendra Mingo, Assistant Director, Community Outreach & Education Program

Hydroville Curriculum Project and ToxRAP™ Train the Trainer Workshops
OSU is home to two NIEHS Centers: the Environmental Health Sciences (EHS) and the Marine/Freshwater Biomedical Sciences (MFBS) Center. The Centers focus on collaborative, interdisciplinary research to determine how environmental chemicals and other agents may be toxic to humans. Specific research conducted by EHS Center investigators helps provide a scientific basis for the prediction of human health risks from exposure to both natural and synthetic environmental chemicals.

In addition to scientific research, the EHS and MFBS Centers use their shared Community Outreach and Education Program (COEP) to increase the public's ability to understand and make informed decisions on issues relevant to the role of environmental factors on human health. The COEP also strives to develop an understanding among the public of environmental health science research and its importance in assessing human health risks. To achieve these goals, the COEP enlists the expertise of Center investigators in active collaborations with existing venues of outreach education such as OSU's SMILE Program, Oregon Museum of Science and Industry (OMSI), and a variety of community organizations. In 2000-01, COEP has focused on its partnerships with the SMILE Program, OMSI, and Rutgers and University of Medicine and Dentistry in New Jersey.

There are several objectives and goals of the COEP program in the EHS and MFBS Centers at OSU:
- To increase the public's ability to understand and to make informed decisions on issues relevant to the role of environmental factors in human health and disease;
- To facilitate appreciation of fundamental concepts of relative risk and scientific methods for risk assessment among scientists, teachers, health professionals and the public;
- To educate scientists and the public regarding the usefulness of aquatic species in assessing environmental risks to human health and in clarifying the mechanisms by which environmental factors can benefit or adversely impact human health;
- To foster partnerships among educators, scientists in academia, governmental agencies and industry to utilize the most advanced methods involving aquatic model systems for addressing human environmental health concerns;
- To provide local expertise for the solution of local environmental health problems.
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Learning through Environmental Health Science Scenarios: the Hydroville Curriculum Project
COEP is entering the second year of the Hydroville Curriculum Project (HCP), a seven year "Environmental Health Sciences as an Integrative Context for Learning (EHSIC)" grant from NIEHS dedicated to dramatically improving the science education and environmental health knowledge of high school students. The EHS and MFBS Centers are partnered in this grant with the OSU Science and Math Investigative Learning Experience (SMILE) Program, the OSU Department of Public Health, and the Oregon State Department of Education. The project uses the Hydroville Curriculum Problems, an existing set of environmental health science scenarios developed with funding from a NIEHS "Environmental Health Sciences Education Teacher Enhancement" grant.
2000-01 Project Benchmarks:

- Adapted and enhanced the Hydroville Pesticide Spill challenge problem into an integrated classroom module, incorporating additional scientific, math, language arts, and humanities content.
- Aligned the Pesticide Spill challenge problem with Oregon and national educational standards.
- Hosted a Teacher Summer Institute and trained 9 teams of teachers (22 total) in environmental health science, team teaching, problem based learning, and implementation of the challenge problem module.
- Developed evaluation tools to address the impact of the curriculum and teaching methods on student achievement and attitudes toward science, risk, and environmental problem solving.
- Introduced the Pesticide Spill challenge problem into 11 SMILE Program after-school clubs and 9 pilot schools with over 1600 participating ninth and tenth grade students.
- Convened the HCP Curriculum Development Team to adapt the Mysterious Illness Outbreak challenge problem into an integrated classroom model.

Toxicology and Risk Assessment & Pollution (ToxRAP™) Teacher Training Workshops
COEP is continuing to offer professional development opportunities for teachers and to disseminate the early elementary, intermediate elementary, and middle school modules of the ToxRAP™ (Toxicology, Risk Assessment and Pollution) curriculum as part of Environmental Health Sciences Training and Education Program (EH-STEP). In collaboration with the Oregon Museum of Science and Industry (OMSI) Teacher Education Program, COEP is offering five ToxRAP train the trainer workshops for Oregon teachers in 2001-02.

COEP Program
at
Texas A&M University

Texas A&M University has a rich history of agricultural research that provides a solid foundation for basic and applied research focused on issues affecting rural populations in Texas. The NIEHS Center for Environmental and Rural Health (CERH) was established in 1998 as a Center of Excellence dedicated to study mechanisms of environmental disease. The Center consists of four integrated research cores, six facilities cores, and a community outreach and education program (COEP). The COEP provides education on how to reduce environmental exposures associated with human illness. The primary COEP activity involves training of promotoras (community educators) and colonia (community) residents along the Texas-Mexico border. A cornerstone of this program is an Environmental Health Science curriculum rooted on a "Train-the-Trainer" model of education and outreach. Another important component is a K-12 Education Program that involves incorporation of environmental health issues into public school science curricula. This is carried out in collaboration with faculty of the Partnership Education and Rural Health (PEER). A Brazos Valley community outreach counterpart initiative has also been established to address health concerns in our immediate community.

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PERINATAL/JUVENILE EXPOSURE TO METHOXYCHLOR REDUCES NUMBER OF SPERMATOGONIA AND DAILY SPERM PRODUCTION WHICH PARALLEL REDUCTION IN SERTOLI CELL NUMBER IN ADULT RATS.

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Perinatal and juvenile treatment of rats with Methoxychlor (MXC) reduced testicular size in those animals as adults. The objective was to determine if these males have fewer Sertoli cells that parallel lower numbers of spermatogonia and sperm production rates based on round spermatids. Rat dams were gavaged with MXC at 0, 5, 50, or 150 mg/kg/day for the week before and after they gave birth. Resulting male pups were dosed directly from postnatal day 7 to 42. Across dose groups, there were no differences in the daily sperm production per g of testicular parenchyma, the number of Sertoli cells per g of parenchyma, or ratio of spermatids per Sertoli cell. There were dose-related differences in daily sperm production per testis and number of Sertoli cells per testis. The two highest dose groups had reduced numbers of testicular spermatids and Sertoli cells. In addition, MXC reduces the volume density and the number per g of spermatogonia in testicular parenchyma and the number of spermatogonia per testis. Daily sperm production and number of spermatogonia were directly related to the number of Sertoli cells. In conclusion, male rats exposed to MXC prior to puberty had reduced the number of spermatogonia and daily sperm production which parallel reduced Sertoli cell number as adults. However, Sertoli cell function, based on spermatid/Sertoli cell ratio, did not appear to be altered at high doses of MXC, as the progeny of spermatogonia present underwent less degeneration during meiosis to produce comparable numbers of round spermatids to that of control and low dose. The ratio of spermatid number per spermatogonium was higher ($P<0.05$) in the MXC treated groups. This difference indicated that the testis can compensate for the treatment-induced reduction in number of spermatogonia by reducing the amount of germ cell degeneration of their progeny (spermatids). Hence, oral exposure of pesticides with estrogenic/antiandrogenic effects as youth can reduce spermatogenic potential of males as adults by reducing their number of Serolti cells and number of spermatogonia. Supported in part by NIEHS Contract NO1-ES-15307.

ENHANCING RURAL MIDDLE-SCHOOL SCIENCE EDUCATION VIA AN ON-LINE ENVIRONMENTAL HEALTH SCIENCE CURRICULUM

L. Johnson (PI), J.J. Denton, J.F. Hunter, W.R. Klemm, K.C. Donnelly, I.N. Ramos, C.C. Farnsworth, T.J. Davis, B.L. Smith, and V.B. Hardy. College of Veterinary Medicine; College of Education Texas A&M University

The long-term goal of the Partnership for Environmental Education and Rural Health; (is to develop and disseminate an engaging model for enhancing environmental health science education of grade levels 6-8 in rural settings. Curriculum: Three modules, each lasting for two to three weeks of daily lessons and experiments, have been produced and are being tested in schools. These are: “Water’s the Matter”, “Cells Are Us”, and “Toxic or Not.” Modules include tutorials on common hazards, experiments and learning activities, short biographies of famous scientists, what we know about the subject, how we know, and why it is important to know, and teacher pages (with pre- and post tests, explanations, procedures, resources). Also, a game learning activity (Slime Sleuths at Toxic Island) provides a self-paced fun activity. These modules were field tested in schools and two additional modules, “Properties of Hazards” and “Organ Systems”, are nearing completion to be field tested this year. Professional Development: In two summers, 33 teachers came to Texas A&M for a week to receive technology training, to review the curriculum, and to perform the experiments. Also, 91 additional teachers received certification for 12 hours of training in water quality testing and classroom experimentation at regional locations throughout the state, and 16 teachers received an one-day workshop in “Cells are Us” or “Water’s the Matter” in conjunction with COEP NIEHS Center in Galveston. A repeat intensive workshop (one week at Texas A&M) and four regional workshops for 64 interested teachers are planned for this summer. School Visits: Scientist visits to public middle schools have provided over 4,200 students in over 30 rural school districts an opportunity to learn about experimentation and environmental health science first hand. Likewise, over 600 teachers, teacher aides, and parents have attended these presentations on health and the environment. Scientist visits are on-going throughout the school year. The goal is to enhance a large number of students to enter and remain in science academic tracks. NIEHS Grant R25 ES 10443.

USING PROBLEM-SOLVING ADVENTURES TO INTEGRATE ENVIRONMENTAL HEALTH SCIENCE INTO RURAL MIDDLE-SCHOOL CURRICULA.

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The long-term goal of the Partnership of Environmental Education and Rural health (http://peer.tamu.edu) is to encourage teachers across all fields to utilize environmental health science topics to motivate students and help them relate science instruction to the real world. Specifically, we have developed an engaging model for integrating environmental health science into mathematics, English language arts, social studies, and science in grades 6-8. Rural schools are emphasized in this project because of increased health risks associated with rural environmental hazards. During the first year, six instructional modules will be produced reflecting the Texas Essential Knowledge and Skills (TEKS) for 6th grade social studies, English, mathematics, and science. Each module is integrated around an adventure story written by a professional children's author. Social studies content directs the location and time (historical or contemporary). For example, in Texas, children study the world at large in grade 6, the state of Texas in grade 7, and the United States in grade 8. This framework allows construction of adventures that involve different eras and different locations. However, the environmental health problems at these locations and times in history exemplify problems found in the U.S. such as contaminated water and food, air pollution, and contagious or environmentally transmitted diseases. The first adventure is set at the construction site of the burial chambers in ancient Luxor, Egypt. Construction has ceased due to a mysterious illness that causes vomiting and diarrhea in the workers. The students must assess the work environment and formulate a strategy to help solve the problem. Activities include map reading, construction calculations, interviews with characters in the story, and a hands-on science experiment. NIEHS Grant R25 ES10735.

IMPACTT

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IMPACTT (Integrating Multiple Perspectives Across the Curriculum for Today and Tomorrow) is a unique, fully integrated environmental health / environmental science academy, or "school within a school." IMPACTT began in 1999 and is being developed between the Community Outreach and Education Program of the Southwest Environmental Health Sciences Center and Sunnyside High School, in the Sunnyside Unified School District in Tucson, AZ. Course content is presented in thematic units through which students make connections to environmental health and traditional academic subjects. Students obtain academic credits in science, health, math, English, social studies, physical education, and technology. The 9th grade component theme is "The Environment" which consists of five units including Biodiversity, Endangered Species, Air Quality, Land & its Uses and Water. The 10th grade theme is "World Explorations" and is composed of seven units including Origins of the Universe, Origins of Life, Rise of Agrarian Societies, History of Science, Disease & Industrialization, Organizations & Science, and Present Complexities. The 11th and 12th grade components are currently being designed. Eventually IMPACTT will be a full 4-year academy where students who participate in all 4 years will exceed Arizona University System admissions requirements.

Fun Environmental Health Activities
University of Arizona, Southwest Environmental Health Sciences Center
The University of Arizona Southwest Environmental Health Sciences Center (SWEHSC) Community Outreach and Education Program (COEP) has developed an online resource for teachers called "Fun Environmental Health Activities." The website includes original materials developed by the SWEHSC COEP, as well as materials that have been partially or extensively modified by the SWEHSC COEP. There are interactive web-based programs, downloadable curricula materials, and Power Point lectures related to different Environmental Health topics including basic toxicology, air quality, epidemiology, cancer, and pharmacology. The poster highlights the website and includes brief descriptions of each of the online activities. Complete print-outs of the materials will be available for review. A lap top computer will also be available
to try the interactive web-based programs.

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NIEHS UC Berkeley Center COEP
Development of Nutrition Education Materials for Low Literacy Populations

Identification of Barriers to Increasing Fruits and Vegetable Consumption in a California Latino Population

This community outreach project involved collaboration with three groups: the COEP, San Joaquin County Expanded Food and Nutrition Education Program (EFNEP), and the Undergraduate Research Apprentice Program at the University of California, School of Public Health.

One of the primary objectives was to better define obstacles and barriers to increasing fruit and vegetable intake. The end goal was to obtain information for the development, distribution and effective use of culturally appropriate nutrition education materials that focus on increasing fruit and vegetable intake.

Small group discussions were held to learn about the nutrition education needs of the California Latino population. The project also provided nutrition education to the participants of the discussion groups. Sites were community centers in Fruitvale, La Clinica de la Raza (east bay San Francisco area) and Lodi Community Center (rural area in San Joaquin county).

Groups were comprised of 8 to 12 persons. There were 8 small group sessions, each lasted approximately 1 _ hours. Topics discussed included the relationship of food to health and factors that motivate change. The discussions were guided by a set of questions and were run as "open discussion". Specific questions addressed included: what would motivate an increased consumption of fruits and vegetables; what type of information (tips, suggestions, shopping tips, food storage tips) might be useful to incorporate to make nutrition education materials and tools more effective. All

groups were conducted in Spanish. Both men and women participated.

A series of 6 informational handouts have been developed as a result of this project. A manuscript has been submitted for publication.

The Center for Environmental Genetics (CEG), University of Cincinnati
Dr. Eula Gingham – COEP Director, Dr. Susan VanDale – COEP Coordinator

In 1998, the Center for Environmental Genetics (CEG), University of Cincinnati, began an outreach project called LEGENDS (Learning Exchange for Genetic and Environmental Disease Solutions) that was directed to communities. Curriculum was developed containing information on 6 topics, including environmental health, genetics, genes and disease, environmental genetics, genetic testing, and human genome research. Presentations made use of multimedia and interactive exercises, such as games, video skits, and role-plays. Factual knowledge was organized into 24 short, project-developed, thematic modules. CEG members and their Department of Environmental Health colleagues, other scientists, local educators, and worker health and safety trainers collaborated to present the educational sessions.

Since there were no instructional materials available, this program was developed de novo by the COEP and has been extensively reviewed and evaluated. A wide range of adults has been trained, including blue-collar workers), science teachers, health care workers and sanitarians, community activists and minority community members. These groups represent all educational levels. A planning meeting was scheduled with group leaders to customize the lesson plan to the needs of their constituencies. To date, over a thousand people have participated in workshops and discussions based on environmental genetics.

Evaluations provide quantitative and objective indicators of the excellent quality of this program. 93% of workshop participants rated the educational sessions on environmental genetics as excellent or good. Pre and post-tests of participants to determine how much knowledge was gained revealed that the relative percent change in knowledge regarding concepts ranged from 11% to 53% with a median change of 32%. The tests measuring ability to identify features of genetic and environmental diseases ranged from 19% to 43% (relative percent change) with a median of 33%. (These results compare favorable with comparative evaluation data obtained in the Midwest Consortium Hazardous Waste Worker Training, a highly ranked worker-training program.)

The evaluation indicated that a large majority (94%) of workshop participants indicated they would be able to apply the knowledge obtained in the session; 75% noted that the information would help them better understand mass media coverage given to related topics; 72% said that the session motivated them to look for further opportunities to learn more about issues related to genetics and environmental genetics. 68% indicated that they would use the information in situations related to their work.

Presentations have been made at the Society of Toxicology, the American Public Health Association, the North American Association of Environmental Educators, and Zeta Phi Beta, a national sorority dedicated to the education of African Americans. Environmental genetic issues have also been highlighted in special events such as “6th Biennial Conference on Communication and Environment” (National Communication Association) and “A Decade of ELSI Research” (NHGRI & DOE). Recently, COEP began a pilot-project to provide six community trainers with information regarding environmental and genetic factors in disease and genetic testing, along with strategies to safeguard the rights of minorities and underserved workers with regard to genetic privacy.

"Environmental Health Sciences Institute (EHSI): Science Education and Research Opportunities for Rural Youth"

The University of Iowa
Environmental Health Sciences Research Center
Community Outreach and Education Core (COEC)
Shannon P. Márquez, PhD, MEng, COEC Director

The Environmental Health Sciences Institute for Rural Youth (EHSI) is a one-week residential summer program at The University of Iowa sponsored by the Environmental Health Sciences Research Center (EHSRC). EHSI was created by the EHSRC in 1997; development of the Institute continues with administrative support from the University of Iowa Belin-Blank International Center for Gifted Education and Talent Development and the Women in Science and Engineering Program. Each EHSI student receives a $550 scholarship to cover the entire cost of the Institute. EHSI is a self-nomination program; any student from rural Iowa (town of 2,500 or less) who is currently in 9th grade is eligible for participation. Each year, EHSI provides 15 talented students with an intensive hands-on educational experience in areas related to the research cores and facility cores of the EHSRC. The program is designed to enhance participant's intellectual and social growth, and a variety of learning activities are provided including: didactic, small-group discussion, laboratory, and field exercises. Students participate in team-building activities and also receive practical experience with information technology. Each student also develops an independent research project on one or more of the topics covered and prepares a lecture. After attending camp, the 15 participants are required to return to their home communities and give at least two formal presentations on their research topic to school and public groups. A $300 stipend is awarded to the student following completion of the two presentations. Over the last three years, EHSI students have returned to 49 Iowa counties to present their research, touching more that 2,500 rural students, educators, administrators, school board members, 4-H clubs and others. Of the 14 original 1997 EHSI students, nine have declared a college major in science or engineering.

University of Medicine and Dentistry of New Jersey
Center for Environmental Health Sciences (Grant No. P30 ES05022)
National Institute of Environmental Health Sciences (NIEHS)
Center of Excellence

The Community Outreach and Education Program (COEP) at the NIEHS Center of Excellence in New Jersey, located at the Environmental and Occupational Health Sciences Institute (EOHSI), is jointly sponsored by the University of Medicine and Dentistry of New Jersey (UMDNJ)-Robert Wood Johnson Medical School and Rutgers, The State University of New Jersey. COEP, in conjunction with the UMDNJ-School of Public Health, is managing EH-STEP (Environmental Health Sciences Training and Education Program), a nationwide K-12 educational initiative support by the National Center for Research Resources under the Science Education Partnership Award Program (Grant No.R25 RR15621). Through this project, COEPs at eight NIEHS Centers of Excellence are collaborating to enable more than 40,000 students nationwide to improve their basic science and math skills while learning to reduce their exposure to potential pollutants and possibly prevent environment-related diseases and illnesses. As such, over 2,000 educators will be integrating environmental health sciences (EHS) curricular materials into their science and math lessons through teacher professional development opportunities.

COEPs at Oregon State University, University of Arizona, University of Southern California, University of Texas Medical Branch, University of Wisconsin-Madison, Vanderbilt University and Wayne State University are participating with UMDNJ. Each COEP has established a Regional Education and Training Center (RETC) at its site to provide professional development opportunities for teachers. Partners also include scientists from these centers and the Toxicology Education Foundation (TEF). This broad-based partnership will ensure that the project is translatable nationwide.

A curriculum dissemination through professional development model is utilized. This model comprises four main components–EHS curricula, train-the-trainer workshops, teacher trainings and scientist involvement–and expands on two of EOHSI's successful nationwide programs: the ToxRAP™ Education and Training Program, currently supported by TEF, and the ToxRAP™ Network which was a joint program, supported by NIEHS, with the University of Arizona. ToxRAP™, an award-winning EHS curricula developed by EOHSI with support from NIEHS, is serving as the initial curriculum for dissemination. A Curriculum Selection Board (CSB) is identifying additional materials that will be incorporated into EH-STEP. During the first of two selection periods, the CSB chose The Environmental Cyber Schoolhouse developed by Wayne State University and Chemicals, The Environment, and You, a National Institutes of Health curriculum.

RETC teams attend train-the-trainer workshops on implementing the selected curricula, as well as designing/delivering effective teacher training programs. Each RETC is responsible for providing trainings and curricula to K-12 teachers in its region. A Scientist Involvement Advisory Board is developing strategies for scientists to interact with teachers/students and to encourage students to pursue careers in biomedical and behavioral sciences research. Ongoing support is provided through Internet-based technologies. Formative and summative measures are used to analyze project effectiveness.

AMBIENT Project

(Atmospheric and Marine-Based Interdisciplinary Environmental Health Science Training)

Lisa Pitman EdD, Lora E Fleming MD Phd, Helena Solo Gabriele Phd, Mary Jo Trepka MD MPH, Wendy Stephan MPH, Dominick Squicciarini MPH, Suzie Collins, Paula Nelson, Pat Walsh Phd.

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http://www.rsmas.miami.edu/groups/niehs/ambient

Miami-Dade County is home to more than 2.1 million people. Ethnic diversity is extensive, with a population that is 52% Hispanic, 34% African American, 13% White, and 1% American Indian/Asian/Other. The Miami-Dade County Public Schools is the 4th largest district in the country with more than 350,000 students, more than 93,000 of which are in grades 9-12. There is significant need within the public high school system to involve students with research scientists and members of the community in an interdisciplinary approach to learning about local environmental health science issues.

The AMBIENT Project is a systemic approach to environmental health science education. Focused around the 4 environmental themes of air, water, soil and food, a health-science problem-based learning approach will be delivered by trained teachers to the ethnically-diverse population of high school students in Miami-Dade County. The teachers will work together to enhance understanding of environmental and ethical issues through a hands-on summer workshop with research scientists from the University of Miami, Florida International University, and County Department of Health. Best practices from existing environmental curriculum materials will be assembled for use in the training. An important emphasis of the project will be to provide team teaching strategies for incorporating interdisciplinary activities into the large classes of more than 35 students at the high schools.

The project is modeled after three highly successful environmental teacher training models, GLOBE, IN-STAR and the SECME Summer Institutes, and draws the best from each. Classroom activities and assessment tools will be incorporated into a problem-based learning Web site. Technology for Learning will provide formative and summative assessment of the project.

To date, environmental health Science Curriculum have been created and piloted concerning Water/Sewage, and Soil/Lead. These modules are being evaluated and disseminated, while new modules on Air/Asthma and Food/Marine Toxins are being created. This project addresses the need defined by Priority 8.2 of Healthy People 2000: Educational and Community-Based Programs, which is to increase high school completion rates to 90%, especially with regard to Hispanic and Black American students.

This study is funded in part through the National Institute of Environmental Health Sciences (NIEHS) K through 12 Program at the NIEHS MBFC at the University of Miami.

Human Health Effects from Exposure to Marine Recreational Waters

Wendy S Quirino*, Lora E. Fleming, MD, PhD, MPH, MSc**, Helena Solo Gabriele Phd+, Dominick Squicciarini MPH**, Margia A Arguello*.

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Microbial water quality indicators are used to determine whether a water body is safe for recreational purposes. The microbial indicators used are found in high concentrations in sewage. Therefore, if high concentrations of the microbial indicators are found in a water body, then there is reason to suspect that the area is impacted by sewage and thus not safe for swimming. Recently there have been concerns raised about the appropriate use of microbial indicators to regulate recreational uses of water bodies, in particular water bodies located in tropical and sub-tropical environments. Some of the concerns include the potential for the indicators recommended by the USEPA to multiply (or regrow) in the environment, thereby resulting in artificially elevated concentrations above that observed from sewage impacts alone and the lack of water quality and epidemiologic study within tropical and sub-tropical regions which is where regrowth of the microbial indicators is suspected to occur.

The purpose of this analysis was to preliminarily assess whether microbial indicators are useful tools for establishing recreational standards within sub-tropical environments for areas where there is no known discharge of sewage. Specifically, this project evaluated the relationship between microbial water quality indicators and public health. Three water quality indicators were utilized for this evaluation: enterococci, fecal coliforms, and *Clostridium perfringens*. The relationship between public health and microbial indicators was evaluated through this investigation within 2 beaches in Miami-Dade County. One beach had been characterized by elevated concentrations of microbial indicators relative to that observed at the second beach. Neither beach received sewage discharges from a known source. Water samples were collected daily at each beach during a wet and dry season month. An epidemiological questionnaire previously used in a large study of Los Angeles recreational beach goers was adapted to assess the swimming related symptoms and exposure as a prospective cohort study. The data were evaluated for differences in self reported symptoms between the 2 beaches and between the dry and wet months, as well as other analyses.

From the epidemiological point of view, issues of relatively small sample size of the participant population, as well possible participant selection bias and exposure assessment, limit the analysis of these Pilot study data. the final study population consisted of 63 families with 208 (86%) individuals (3.3 individuals/family); 75 (36%) were interviewed during the dry month and 99 (46%) at Hobie Beach. In all, 35 (17%) of the subject population reported at least 1 symptom occurring since their visit to the beach, with cough (7%) and skin rash (5%) being the most frequently reported symptoms. In general, there was no significant association between the number or type of reported symptoms, and the different sampling months or beach sites, although persons who returned repeatedly to the beach ("Over exposed") were more likely to report symptoms. Overall, the number of indicator organisms correlated negatively with the frequency of symptoms reported by recreational beach goers, possibly due to the lack of individual exposure information. Larger epidemiologic studies are recommended to further evaluate these associations.

This study was funded in part through the National Institute of Environmental Health Sciences (NIEHS) Pilot Project Program at the NIEHS MBFC at the University of Miami, as well as the Miami Dade Dept of Health and a NIH Minority Undergraduate Training Grant.

Community Outreach and Education Regarding the Health Impacts of Uranium Mining and Milling in the American Southwest

University of New Mexico
Teresa Coons, PhD

Uranium mining and milling operations played an important role in the social, economic and political life of the American Southwest for more than five decades. Although it is now widely recognized that uranium miners suffer a disproportionately high risk for lung cancer and other lung diseases, workers in other parts of the uranium industry may also suffer from work-related illnesses, and the legacy of the uranium industry reaches beyond the workers to their families and communities. Environmental and human impacts are part of the ongoing legacy of this industry. The potential for historical and ongoing environmental exposures related to the presence of uranium mines, mills, and their respective waste products in close proximity to residential communities, and concerns about risks associated with radioactive materials that were brought home on workers' clothes or became building materials for family dwellings has created a climate of fear within these communities. Community members, healthcare providers, politicians and educators continue to seek answers to questions such as

1. Are individuals in uranium-impacted communities at risk because of their work or environment?
2. How have these individuals been affected by their exposures and how might these individuals, their family members or other residents of the community be affected in teh future?
3. How can individuals, family members, community residents, and future generations best deal with these effects?

The University of New Mexico COEP, in collaboration with other regional institutions and community-based organizations, has been working to transfer the currently available research knowledge about uranium-related health risks to the impacted communities. One example of this information transfer and educational process will be presented. The objective of workshops and meetings such as those described in the poster presentation is to provide the kind of information that is necessary for community leaders, residents, and healthcare providers to make informed decisions about the need for resource commitments to protect human health and for individuals to gain a better understanding of their risks and options.

Case-based Risk Assessment Training Module for Native American Communities Impacted by the Cerro Grande Fire

University of New Mexico

Johnnye Lewis, PhD

The Cerro Grande Fire burned approximately 43,000 acres including 7,500 acres of Los Alamos National Laboratory property from May 3 to June 10, 2000. The fire continues to raise major public health concerns in communities in Northern New Mexico, particularly the fear of a major nuclear exposure to the communities in the wind plume during the fire and now with increased rain and snow melt to the downstream communities in the watershed. While substantial emergency response efforts were focused on the Los Alamos town site, very little attention was paid to the concerns of the eight Native American Pueblos in the vicinity and the five down river tribal communities. During the fire many tribal communities were affected and their community health representatives (CHRs) were looked to for information on health effects to tribal members. However the CHRs had no previous training in environmental health issues, nor were they able to interpret the data that was collected by numerous federal and state agencies. Frequently there are only one or two CHRs for a community of 300 to 3000 people.

In response to the Pueblos' concerns the Community Environmental Health Program (CEHP) has developed a case-based risk assessment training module for Native American communities using the Cerro Grande Fire a model scenario. Often when tribes encounter state and federal agencies on environmental health concerns, they find unique exposure concerns related to tribal and cultural practices are not taken into consideration. The multidisciplinary staff at CEHP has incorporated into the module and teaching methods concepts that are culturally sensitive. In this way the tribal staffs are learning to evaluate land and water use and possible exposures by themselves without divulging sensitive practices that need to be kept private. During each presentation special attention has been taken to include discussion on specific concerns of the Pueblo and their members.

To date, trainings in environmental health have been provided to at least twelve of the New Mexico Tribal Communities, more than sixty individuals. Following participation in the fire risk module, there has been significant interest to learn about other environmental health concerns and subsequent trainings have included other topics such as pesticide use and environmental lead exposures. Issues such as increased exposures resulting from unique resource use in cultural practices, interactions of environmental and occupational exposures, and bioaccumulation of contaminants have also been discussed. The modules focus on evaluating data quality and sufficiency, developing conceptual models, and encouraging environmental staffs and CHRs to work together.

Community Outreach and Education Program
UNC-CH Center for Environmental Health and Susceptibility

Frances M. Lynn, Dr.P.H,

The purpose of the UNC-CH three panel display is to acquaint others with (a) the research foci of the newly established (April, 2001) Center for Environmental Health and Susceptibility at the University of North Carolina at Chapel Hill; (b) the activities of the Center COEP; and, (c) the scope of the COEP's supplemental grant that looks at the ethical, legal and social issues involved in environmental genomics.

The UNC-CH Center focuses on environmental epidemiology and toxicology and has three areas of concentration: genetic susceptibility, which brings together laboratory and molecular epidemiological research; developmental susceptibility, particularly on conception through childhood; and toxicokinetic susceptibility, which looks at inter-individual differences in physiological and metabolic factors that occur in response to exogenous agents. Four facility cores support the three research areas: high-throughput genotyping; biostatistics and epidemiological methods, biomarkers, and nutrient assessment.

COEP activities include outreach and education to three groups: North Carolina communities, policy makers, and schoolteachers. Two integral components of COEP activities are a broad based Community Advisory Committee and the involvement of UNC-CH students in outreach and education. In addition, the COEP is responsible for the Center's website and newsletter. To date, the COEP has: collaborated with a low income community to assemble data on local air pollution; analyzed three COEPS and also inventoried the activities of 27 COEPS; conducted three focus groups among scientists and citizens, which looked at incentives and barriers to collaboration. In addition, the COEP is surveying NC teachers to determine topics of interest that draw on Center research strengths as a prelude to offering teacher professional development.

During the coming year, with supplemental NIEHS funding, the COEP will produce educational materials on the ethical, legal and social issues involved in environmental genomics. This work will be done in collaboration with the University of Cincinnati COEP, two organizations from our Community Advisory Committee, the NC Breast Cancer Coalition and the NC Occupational Safety and Health Project, and a diverse scientific advisory committee. The main educational products of the grant are: two interactive educational modules, one focusing on breast cancer and the other occupational exposure; and a booklet, which presents an overview of environmental genomics and attendant ethical, legal and social issues. These products will be piloted with members from our two community partners.

"My Environment, My Health, My Choices"
University of Rochester Environmental Health Sciences Center

Dina Markowitz, Ph.D., Director, Community Outreach and Education Programs

The "My Environment, My Health, My Choices" program, supported by the EHSIC grant program from NIEHS (1R25 ES10717), will facilitate the development, by middle and high school teacher teams, of new curricula that incorporate environmental health education into science, social studies and health classes. Fifteen teams of middle school and high school science, social studies and health teachers will take part in this program over the course of seven years. Each team will be composed of a science, social studies, and a health teacher. Five teams of high school teachers have been selected for the first phase of the program, which began during the summer of 2001. These schools represent urban, rural and suburban areas. Five middle school teams will enter the program during summer 2003, and five additional teams of middle or high schools will enter the program during summer 2004.

Details of the "My Environment, My Health, My Choices" program include the following:

- Teachers will work with faculty from the University of Rochester's Environmental Health Sciences Center and the University of Rochester's Margaret Warner Graduate School of Education and Human Development to develop unique curriculum units around a specific environmental health topic or problem that is chosen by the team. Each team will focus on a different topic, ranging from urban environmental exposures, (lead and air pollution) to overpopulation, to household environmental hazards. All curriculum units will align with New York State education standards.
- Teacher teams participated in a one-week summer training workshop at the University of Rochester. The workshop introduced the teachers to relevant environmental health and curriculum development issues by experts in these fields. Follow-up workshops will be held three times each school year to monitor the teacher's progress, and to allow them to present portions of their curricula.
- Each team is paired with a scientist mentor who will assist teachers in locating resources, help to review the curriculum units, and help to monitor the teachers' progress.
- Funding is provided for teachers to develop and implement the curricula and for classroom materials and supplies for the duration of time that each school participates in the project.
- University of Rochester faculty will provide significant follow-up and evaluation of the program during the entire grant period.
- Curriculum units from all participating schools will be available in written and electronic formats for national dissemination.

Information on the "My Environment, My Health, My Choices" program is available at:
http://www2.envmed.rochester.edu/envmed/EHSC/outreach/MyEnvironment.html

Addressing Traffic Density and Public Health Concerns

By Andrea M. Hricko, COEP Director, Southern California Environmental Health Sciences Center (University of Southern California and UCLA)

Community Partners: Boyle Heights Mejoramiento, Environmental Health Coalition (EHC), West Harlem Environmental Action (WEACT), Communities for a Better Environment (CBE), Pacoima Beautiful, and Liberty Hill Foundation

University partners: Center for Environmental Health in Northern Manhattan (CEHNM) at Columbia University, USC Sustainable Cities Program and the Urban and Environmental Policy Institute (UEPI) at Occidental College, Neighborhood Knowledge L.A. (NKLA) at UCLA

Abstract of poster:
Aim: The Community Outreach and Education Program (COEP) of the Southern California Environmental Health Sciences Center (SCEHSC), in concert with numerous university and community partners, aims to increase public understanding of traffic and human health effects in urban neighborhoods where environmental health problems resulting from heavy traffic are key scientific and community health concerns.

The COEP is addressing this issue on a number of fronts, by:
(1) Enhancing science education in the classroom through a joint "Traffic and Public Health" program with the Columbia University CEHNM and its community partner WEACT. Through an administrative supplement to their NIEHS Centers, the COEPs are purchasing hands-on monitoring equipment to measure traffic-related air pollutants. With the Environmental Health Coalition in San Diego, the COEPs are developing classroom materials and teaching students how to use the air monitoring equipment.

(2) Empowering residents to conduct their own measurements using SCEHSC equipment. For example, the COEP has worked with a grassroots organization addressing concerns about traffic density (safety, noise, and air pollution, especially diesel exhaust from trucks) in an East L.A. neighborhood where schools abut freeways.

(3) Developing environmental leadership skills in students by working with community-based organizations (EHC, CBE) to develop and teach week-long high school courses targeted at specific communities with disproportionate impact from exposure to traffic-related pollutants. E.g., in San Diego, the SCEHSC and EHC taught 150 students (in English and Spanish) a special curriculum and took students on a field trip where they were able to do their own hands-on monitoring of fine particulate matter. Students subsequently volunteered to testify at a public hearing on air pollution.

(4) Increasing public awareness of the connections between environmental justice (EJ) and traffic. The SCEHSC was invited to organize a workshop on Diesel and Environmental Justice sponsored by the Liberty Hill Foundation for its EJ grantees.

From the Bench to the Public - the Community Outreach and Education Program of the Center for Research on Environmental Disease. R. Fuchs-Young, Ph.D., D. Cook, MS, J. Rodriguez, and J. DiGiovanni, Ph.D. The UT M.D. Anderson Cancer Center, Science Park Research Division, Smithville TX and UT Austin College of Pharmacy.

The Community Outreach and Education Program of the Center for Research on Environmental Disease has a focused series of programs and activities aimed at communicating information about environmental health and science to our target audiences, including the students, educators, civic groups and general public in Central Texas. Center research provides the basis for the Outreach program, that seeks to provide current knowledge about causes and prevention of environmental disease, especially cancer.

For students we provide career development seminars and science and health education to help them make healthy lifestyle choices that reduce their risk of disease. Three key projects for students are the veggie-mon.org web site, the CD-ROM based curriculum enhancement called SCREAM, and internships for high school and undergraduate students at the Center.

The "Veggie-Mon" website for 3rd through 8th graders is named for the mascot that guides students through the pages designed to support and enrich existing science and health curricula. The site (http://www.veggie-mon.org) was developed in collaboration with teacher interns working at the COEP during the summer, and uses illustrations, animations, games, quizzes, experiments, a glossary, and a virtual journey to the Antarctic to teach environmental health and science. It also challenges kids to be "in charge of their own health" and to make healthy lifestyle choices. Currently, Veggie-Mon includes information about sun safety, nutrition, and cancer research at the Center. New sections on tobacco avoidance are being added. The site provides educational enrichment for students in elementary and middle schools, especially those in rural or underserved school systems that may lack funds for supplemental materials. Students can read about cancer prevention and learn a little about how scientific investigations are conducted in a modern laboratory and the field. The material contained within the site is responsive to the Texas Essential Knowledge and Skills (TEKS) and can serve as curriculum enhancement to assist teachers in communicating required concepts and principles.

For teachers we offer professional development and scientific education through in-service workshops, summer internships, and electronic resources like the Environmental Health Educators' Quarterly. The email quarterly is designed to help educators identify useful internet resources covering a variety of environmental health and science topics. In compiling each issue Don Cook, Outreach Coordinator and editor of the Quarterly, draws from a variety of sources, including magazine and journal articles, Web searches, and other COEP publications. Targeted to teachers, curriculum supervisors, and school nurses, the Quarterly has a direct mailing list of 450 (you are invited to subscribe at http://sciencepark.mdanderson.org/cred/subscribe.html - it's free!). As the CRED program develops new programs and materials for health and science educators and students, the Quarterly will continue as a key venue of dissemination.

For civic groups we provide education about cancer risk and prevention using the "Environment and Cancer" slide module. The slide module covers basic toxicology, genetics, cancer biology and environmental carcinogens and was developed by the Center faculty. The module translates the most current information about environmental causes of cancer into understandable language and provides tips on disease prevention.

To serve the general public, the COEP answers questions about cancer and environmental disease submitted by telephone and email, hosts community forums, and maintains a comprehensive internet site on current research and outreach activities. We also communicate via various media outlets about the scientific accomplishments of CRED faculty and staff and other NIEHS-sponsored research.

IICOMOH (I'm In Charge of My Own Health): Are They Getting the Message?

S. Spaw BA, D. Cook, MS, R. Fuchs-Young, Ph.D., L Walters, Ph.D.

Objective At a time when most children trust what they read on the World Wide Web, science communicators take on a great responsibility when publishing scientific information there. One Web site (www.veggie-mon.com) introduces primary schoolchildren to environmental health topics, such as nutrition, bacteria, and ultraviolet radiation effects on the skin. The Veggie-mon Web site was created by Texas teachers who interned at the Center for Research on Environmental Disease-Community Outreach and Education Program at the University of Texas M.D. Anderson Cancer Center, Research Division, in Smithville, Texas. This study was to assess the effectiveness of the Veggie-mon Web site in communicate science information to schoolchildren.

Methods Focus groups of elementary and middle school students attending rural schools east of Austin, Texas, will be used to determine whether the Web site is reaching its intended audience. As each student looks through the Web site at will, an investigator will watch from a short distance. The investigator will take notes on items such as the directions the student moves through the site, the time spent in certain areas, the student's behavior and audible comments, and so on. The investigator will respond to the student's questions and comments, if asked. Once the student finishes perusing the site, the student will be asked d questions posed by the investigator. The answers are expected to help determine what the student remembered, learned, liked or disliked about the Web site.

Expected Results Nearly 90 percent of the total student population in the target schools are expected to participate. We are not expecting 100 percent response because of the difficulty of obtaining written parental consent and absenteeism on the days that investigators visit the respective schools. Most students are expected to remember, learn from, and like the site. Students will have the option of suggesting more interactivity and games, less text, or more sophisticated graphics. But, otherwise, the results are expected to show favorable responses to the veggie-mon Web site.

Conclusion We anticipate that the Veggie-mon Web site will prove to be an effective information source about environmental health for schoolchildren. From this site, schoolchildren may discover ways to modify their behavior in a manner that enhances their health as well as those around them. The site's sponsors will implement suggestions from the focus groups to increase the site's effectiveness and further promote good health.

UTMB

The NIEHS Center in Environmental Toxicology & the Sealy Center in Environmental Health & Medicine have evolved to its present status as unique entities in Southeast Texas, home to the largest petrochemical complex in the nation. Galveston's pivotal location was a large motivational factor for creating Centers focusing on environmental health sciences at the University of Texas Medical Branch. The Centers are dedicated to the study of environmental health science problems, as well as to the education of our community about prevention and solutions to these problems. The Centers focus the environmental concerns of and develops useful programs for the local communities via the Community Outreach & Education Program (COEP). The COEP coordinates the interactions of a multi-disciplinary cooperative of research scientists with students, at-risk populations, health care providers, industry leaders, and community groups. Specifically, two areas have evolved as a central focus of the Centers' COEP, an Environmental Health K-12 Education Program and an Asthma Outreach and Education Program.

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Community partnerships create collaborations to discuss environmental health equity issues.

Chetana Acharya MS, Jonathan F. Sharpe MEd, Krissandra Freeman, Thomas M. Burbacher, PhD and David L. Eaton, PhD

Despite the improvement in the health status of people in the United States, there continues to be disparity in death and illness experienced by poorer and racial/ethnic minority populations. In September 2000, the NIEHS Center for Ecogenetics and Environmental Health organized a town meeting to focus on environmental health and environmental justice issues in Washington State. The town meeting, 'Voices for Healthy Environments, Healthy Communities' was successful because of the Center's commitment to a truly participatory process. The planning team made an effort to have equal representation from community organizations, government agencies, scientists and affected individuals. Over 200 participants attended workshops, discussion circles and the open-mike session; highlighting the complex relationship between environment, health, genetics, socioeconomics and ethnicity/race.

Long-term outcomes of the town meeting include an established partner network to share resources and information, and the Center's participation with partners outside the University. The Center has been particularly active with the Shoalwater Bay Indian Tribe. With funding support from NIEHS, the Center staff is working with the Shoalwater to develop a Shellfish Monitoring Management Plan. This document will allow the community to systematically assess shellfish quality in their Bay. We hope that it will provide the foundation for future work addressing the Shoalwater Tribe's recent high pregnancy loss rate. The decision to focus on developing a management plan was made at a meeting between Center staff, the Shoalwater chairman and the Shoalwater environmental director.

Similarly, partners in the Yakima Valley have developed culturally appropriate curriculum to teach children and adults about reducing exposure to pesticide residues. The Center has successfully obtained funding from the US EPA Region X, Children's Health Program, to help disseminate information to break the take-home pathway of exposure to pesticides by working with Head Start teachers and early elementary education students in the Valley. The Center intends to share the materials developed for use in Eastern Washington with partners in Western Washington.

Building trust and establishing strong community relationships takes time and effort. Successful partner-driven Center activities can be seen as a first step towards addressing environmental health equity issues. The Center for Ecogenetics and Environmental Health intends to continue building relationships with community partners, in order to ensure that cutting edge environmental health science research plays a vital part in community-based decision making.

UW-Madison Education Efforts Target Native American Tribes in Wisconsin

Author—Kevin Niemi, Ph.D., COEP Director, UW-Madison Environmental Health Sciences Center for Developmental and Molecular Toxicology

The UW-Madison EHS Center has a collaborative effort with the Wisconsin Indian Health Professions Office to promote environmental health science programs to Native American populations in Wisconsin. We have offered two trainings to tribal educators in the ToxRAP™ EHS curriculum. An August 2000 training was held for the Lac Courte Oreilles tribal school and one in August 2001 was for the Bad River band. Both bands have reservations and tribal schools in northern Wisconsin. We have also produced a set of extension activities to the ToxRAP™ modules called "The Case of John Small Wolf's Bad Medicine: Clues & Mysteries." This module was written to make ToxRAP™ more culturally relevant for Indian communities. Long-term plans are to continue offering training with plans to reach all eleven Indian Nations of Wisconsin as well as to promote "The Case of John Small Wolf's Bad Medicine: Clues & Mysteries" through both ToxRAP™ Network partners and national public health education avenues.

Community Outreach and Education Program
of the Marine and Freshwater Biomedical Sciences Center
at the University of Wisconsin-Milwaukee

COEPeration in Milwaukee: Engagement with the Community

Jeanne Hewitt, COEP Coordinator
David H. Petering, MFBS Center Director

The Marine and Freshwater Biomedical Sciences (MFBS) Center's COEP program focuses on a range of community education opportunities. These include precollege education, undergraduate and graduate education, and education of inner city minority populations. Specifically, we are beginning our sixth year of developing experiment modules for middle school life science which link basic and environmental health science and working with middle school science teachers to enhance their ability to teach life science concepts. We have also just finished our sixth year of hosting minority college students for summer research experiences in toxicology. A new activity for the coming year will be to participate in a program that increases the understanding of environmental health by graduate nursing students. Finally, we have just begun an environmental justice-based project that intends to increase the awareness of Milwaukee minority populations about the issues related to eating fish contaminated with toxic chemicals. Each initiative is underwritten by grant funding from NIEHS, NCRR, and ASTDR. A hallmark of the COEP is the extensive participation of scientists within the MFBS Center as well as a number of colleagues from diverse disciplines including education, film, and mass communication.

Center in Molecular Toxicology: An Overview of the Outreach Program and Its Activities.

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Vanderbilt's Outreach Program provides information through education and outreach activities for members of the community on environmental health hazards. The goals of the Outreach Program effort are to improve environmental risk perception and to modify individual and population behaviors toward chemical risks. The current and future directions of the Outreach Program focus on identification of specific needs of surrounding communities in order to provide adequate and relevant information in the field of environmental health while translating the Center's research efforts into knowledge that can be applied to public health. To accomplish these goals, the Outreach Program directs its efforts though a variety of programs and activities including Center events, K-12 education and professional assistance.

Center events include an annual *Open House* and *Community Forum Series*. The Open House provides an opportunity for Center faculty to educate undergraduate and graduate students, and professors from area colleges and universities along with community health professionals in the area of toxicology including pertinent research being performed at the Center. The community forum seminar series was developed to provide information to the general public. This forum series focuses upon environmental health issues, in particular those of local and state concern that are currently addressed by the Center's research.

Education programs (K-12) are directed toward both students and teachers. Presentations are made weekly by Center staff at area schools on topics such as toxicology, environmental hazards and chemical safety. The Outreach Program collaborated with several other NIEHS outreach programs on an Environmental Health Sciences Training and Education Program grant to regionally disseminate environmental health curricula. In addition, the Center Associates Program is a curriculum and professional development program that provides educational and facility support for area teachers from the Center. The participants of the program receive support from the Center to perform projects in the area of toxicology, environmental health, or general and specialized science.

The Outreach Program provides assistance for professional scientific and educational societies and organizations. The Outreach Program has assisted the American College of Occupational and Environmental Medicine (ACOEM), Society of Environmental Toxicology and Chemistry (SETAC), MidSouth SETAC, Society of Toxicology and the Tennessee Environmental Education Association with their respective conferences.

Non-Traditional Environmental Health Science Education

EHS Center, Wayne State University

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Along with classroom curricular materials that have been developed by the Environmental Health Science (EHS) Center's Community Outreach and Education Program (COEP) at Wayne State University, the COEP has a very active and influential non-traditional environmental science education program. This program consists of several components: Science Nights (Science Seekers); After School Science Clubs (Science Wizards); Summer Science Camps (Science Encounters) and Saturday Laboratory Institutes. Each of these components is unique and involves students at various grade levels. Science Seekers is an evening for grades K-2. The students are asked to sign up to attend an evening of science with at least one parent. Worksheets are provided for groups as they rotate through fifteen-minute hands-on experimental stations. Science Wizards is provided for grades 3-5. Students assemble with COEP members after school for an hour of science club. High school students are recruited from the local feeder schools to assist with the experiments. Science Encounters is a summer day camp offered to 7th, 8th and 9th graders through the Michigan Metropolitan Girl Scout Council. COEP and EHS Center members guide twenty girls through experiments as they spend a week on campus. In a further effort to expose students to the methodologies that are a daily function of the research laboratories of the EHS Center, the COEP has partnered with the Detroit Area Pre-College Engineering Program to offer Saturday Laboratory Institutes to middle school students. In January and October of 2000, the COEP offered Basic Laboratory Skills I. In January of 2001, the COEP offered the second class (Basic Laboratory Skills II). Fourteen of the students in Basic Laboratory Skills I enrolled in the advanced class. In summary, education in the area of environmental health can extend beyond the traditional classroom. These educational opportunities may have a positive impact on students and their interest in environmental health science.